ISE 225 Engineering Statistics I
Spring Semester 2021
Mon, Wed 12:00-1:50pm

Prerequisite: ISE 220 Probability Concepts in Engineering

Course Objective:
This course will develop skills necessary for an engineer to
- Gather data from a population which is of interest for some question or experiment
- Describe and summarize features of the data
- Infer properties of a population using hypothesis tests, confidence intervals, and Analysis of Variance (ANOVA)
- Understand the basics of statistical learning
- Build and validate statistical models
- Use the R statistical software

Instructor:
Haomiao Jin, PhD
Email: haomiaoj@usc.edu
Office Hour: Meet by Schedule

TA: Sina Baharlouei
Email: baharlou@usc.edu

Textbook:
(Required) R Witte and J Witte, Statistics, 11th edition
(Required) G James, D Witten, T Hastie, R Tibshirani, An Introduction to Statistical Learning: with Applications in R

Homework: Weekly

Scoring: Homework (30%), Mid-exam (30%), Final Exam (30%), Reading Summary (10%)
### Syllabus:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Text Sections</th>
</tr>
</thead>
</table>
| W1: Jan 20  
W2: Jan 25, 27 | Introduction, using R, descriptive statistics | WW: Ch 1-5   |
| W3: Feb 1, 3  
W4: Feb 8, 10  
W5: Feb 17 | Single sample analysis: Point estimation, Hypothesis testing, Confidence interval | WW: Ch 8-13   |
| W6: Feb 22, 24  
W7: Mar 1, 3  
W8: Mar 8 | Two-sample analysis, ANOVA | WW: Ch 14-17   |
| W8: Mar 10  
W9: Mar 15 | Mid-exam review  
Mid-exam |               |
| W9: Mar 17 | No class |               |
| W10: Mar 22, 24 | Basics of statistical learning | JWHT: Ch 1-2   |
| W11: Mar 29, 31  
W12: Apr 5 | Linear regression | JWHT: Ch 3   |
| W12: Apr 7  
W13: Apr 12 | Logistic regression and other classification techniques | JWHT: Ch 4   |
| W13: Apr 14 | Model validation | JWHT: Ch 5   |
| W14: Apr 19, 21 | Regularized regression | JWHT: Ch 6   |
| W15: Apr 26 | Introduction to Nonlinear techniques | JWHT: Ch 7-9   |
| Final exam review: Apr 28 |               |               |
| Final exam: May 7 (11-1pm) |               |               |